

CLAIMS

What is claimed is:

1. An image sensor package comprising:
an image sensor die comprising an approximately or
5 completely planar photosensing surface which receives
external light and converts the received light into an
electrical signal, a plurality of bond pads at the
peripheral side of the photosensing surface, and an
approximately or completely planar non-photosensing
10 surface on the side opposite to the photosensing
surface and the bond pads;
a substrate comprising an insulating layer
comprising an approximately or completely planar first
surface to which the non-photosensing surface of the
15 image sensor die is adhered by an adhesive and an
approximately or completely planar second surface on
the opposite side thereof, a plurality of electrically
conductive patterns being formed on each of the first
and second surfaces;
20 a plurality of conductive wires electrically
connecting the bond pads of the image sensor die to the
electrically conductive patterns on the first surface
of the insulating layer;
a support wall on the first surface of the
25 insulating layer of the substrate around the periphery
of the conductive wires and comprising a plurality of
screw threads on the outer peripheral surface thereof;
and
a mount comprising an aperture into which a barrel
30 comprising a plurality of lenses is mounted.
2. The image sensor package as claimed in claim
1, wherein at least one passive element is further
provided on the substrate at the outer peripheral side
35 of the support wall.

3. The image sensor package as claimed in claim 1, wherein the barrel further includes an infrared blocking glass disposed below the plurality of lenses.

5 4. The image sensor package as claimed in claim 1, wherein a flexible circuit is connected to the electrically conductive patterns formed on the second surface of the insulating layer of the substrate.

10 5. An image sensor package comprising:
a semiconductor die comprising an approximately or completely planar first surface and an approximately or completely planar second surface on the opposite side thereof, a plurality of bond pads to which conductive
15 bumps are bonded being formed on the second surface;

a substrate comprising an insulating layer comprising an approximately or completely planar first surface and an approximately or completely planar second surface on the opposite side thereof, a
20 plurality of electrically conductive patterns being formed on each of the first and second surfaces, the conductive bumps of the semiconductor die being electrically connected to the electrically conductive patterns of the first surface of the insulating layer;

25 a mount on the first surface of the insulating layer of the substrate at the peripheral side of the semiconductor die and comprising a support plate which extends inward and which has an aperture at the center thereof;

30 an image sensor die comprising an approximately or completely planar photosensing surface which receives external light and converts the light into an electrical signal, a plurality of bond pads formed at the peripheral side of the photosensing surface and an
35 approximately or completely planar non-photosensing surface on the side opposite to the photosensing surface and the bond pads, a plurality of conductive

bumps connected to the support plate being formed on the bond pads; and

5 a barrel comprising a plurality of lenses and engaged into the mount above the support plate by a screw connection.

6. The image sensor package as claimed in claim 5, wherein the aperture of the support plate is formed in a position corresponding to the photosensing
10 surface of the image sensor die.

7. The image sensor package as claimed in claim 5, wherein an underfill is filled between the semiconductor die and the substrate in order to improve
15 the mechanical bond strength between the semiconductor die and the substrate.

8. The image sensor package as claimed in claim 5, wherein an underfill is filled between the
20 image sensor die and the support plate in order to improve the mechanical bond strength between the image sensor die and the support plate.

9. The image sensor package as claimed in claim 5, wherein an electrically conductive pattern is
25 formed on the lower surface of the support plate and the inner wall of the mount below the support plate and electrically connected to the electrically conductive bumps of the image sensor die.

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10. The image sensor package as claimed in claim 5, wherein the barrel further includes an infrared blocking glass.

35 11. The image sensor package as claimed in claim 5, wherein at least one passive element is further

provided on the substrate at the outer or inner peripheral side of the mount.

12. The image sensor package as claimed in claim 5, wherein a flexible circuit is connected to the electrically conductive patterns formed on the second surface of the insulating layer of the substrate.

13. A method for manufacturing an image sensor package, comprising:

providing a semiconductor die comprising a first surface and a second surface opposite to each other, the second surface comprising a plurality of bond pads formed thereon, to which conductive bumps are bonded;

15 providing a substrate comprising an insulating layer comprising a first surface to which the semiconductor die is electrically connected and a second surface on the opposite side thereof, a plurality of electrically conductive patterns being formed on each of the first and second surfaces;

20 electrically connecting the conductive bumps of the semiconductor die to the electrically conductive patterns formed on the first surface of the substrate;

providing an image sensor die comprising a photosensing surface, a plurality of bond pads formed at the peripheral side of the photosensing surface and a non-photosensing surface on the side opposite to the photosensing surface and the bond pads, a plurality of conductive bumps being formed on the bond pads;

30 providing a mount comprising a diameter greater than the semiconductor die and comprising a support plate which extends inward and which has an aperture at the center thereof, and electrically connecting the conductive bumps of the image sensor die to the support plate below the aperture;

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mounting the mount on the first surface of the substrate at the peripheral side of the semiconductor die; and

5 mounting a barrel comprising a plurality of lenses into the mount above the support plate.

14. The method as claimed in claim 13, wherein the barrel further includes an infrared blocking glass.

10 15. The method as claimed in claim 13, further comprising mounting at least one passive element on the electrically conductive patterns of the substrate at the outer peripheral side of the mount.

15 16. The method as claimed in claim 13, further comprising connecting a flexible circuit to the electrically conductive patterns of the substrate.

20 17. The method as claimed in claim 13, wherein a plurality of screw threads are formed on the inner peripheral surface of the mount above the support plate to be engaged with a plurality of screw threads formed on the outer peripheral surface of the barrel.

25 18. The method as claimed in claim 13, further comprising filling an underfill between the semiconductor die and the substrate after the electrically connecting the conductive bumps of the semiconductor die to the electrically conductive
30 patterns formed on the first surface of the substrate.

35 19. The method as claimed in claim 13, further comprising filling an underfill between the image sensor die and the support plate after the electrically connecting the conductive bumps of the image sensor die to the support plate.

20. The method as claimed in claim 13, wherein
an electrically conductive pattern which is
electrically connected to the conductive bumps of the
image sensor die is formed on the lower surface of the
5 support plate and the inner peripheral surface of the
mount below the support plate.